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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/670,319

09/26/2003

Martin W. Weiser

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EXAMINER

NGUYEN, DILINH P

ART UNIT

PAPER NUMBER

2893

MAIL DATE

DELIVERY MODE

12/08/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/670,319	Applicant(s) WEISER ET AL.	
	Examiner DILINH P. NGUYEN	Art Unit 2893	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 7-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 4 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andricacos et al. (U.S. Pat. 6224690) in view of Abbott (U.S. Pub. 2003/0178707).

Regarding claims 1 and 8-9, Andricacos et al. disclose a semiconductor package comprising a lead-free solder (abstract, column 3, lines 25-29), whereby the lead-free solder ball substantially avoids alpha particle emission (column 9, lines 62-65 and column 10, lines 35-37). The lead-free solder of Andricacos et al. encompasses an alpha flux of less than 0.0005 cts/cm²/hr, an alpha flux of less than 0.0002 cts/cm²/hr or 0.0001 cts/cm²/hr.

Andricacos et al. do not explicitly disclose the refined lead-free solder.

However, Abbott discloses a semiconductor package comprising a lead-free solder, such as pure tin.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the refined lead-free solder as taught by Abbott into the device structure of Andricacos et al., in order to improve process yields and device reliability.

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Regarding claims 2 and 4, Andricacos et al. disclose the lead-free solder predominately comprises Sn (column 4, lines 19-23).

3. Claims 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andricacos et al. (U.S. Pat. 6224690) in view of Abbott (U.S. Pub. 2003/0178707) and further in view of Schrock (U.S. Pat. 6221691).

Andricacos et al. substantially disclose all the limitations as claimed above except for the solder predominately comprises Ag, Bi, Cu or In.

However, Schrock discloses a semiconductor substrate comprising a die 10, a substrate 22, a solder predominately comprises Ag (column 2, lines 5-10). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the solder predominately comprises Ag as taught by Schrock into the device structure of Andricacos et al. in order to improve the heat transfer from the die (column 2, lines 9-10).

Regarding claim 7, Schrock discloses the solder predominately comprises In [63%In/37%Sn] (column 4, lines 4-5).

Response to Arguments

Applicant's arguments with respect to claims 1-4 and 7-9 have been considered but are moot in view of the new ground(s) of rejection. See the new ground of rejection above.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DILINH P. NGUYEN whose telephone number is (571) 272-1712. The examiner can normally be reached on 9:00 AM - 6:30 PM (Monday-Thursday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Davienne Monbleau can be reached on (571) 272-1945. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DLN

/A. Sefer/
Primary Examiner
Art Unit 2893